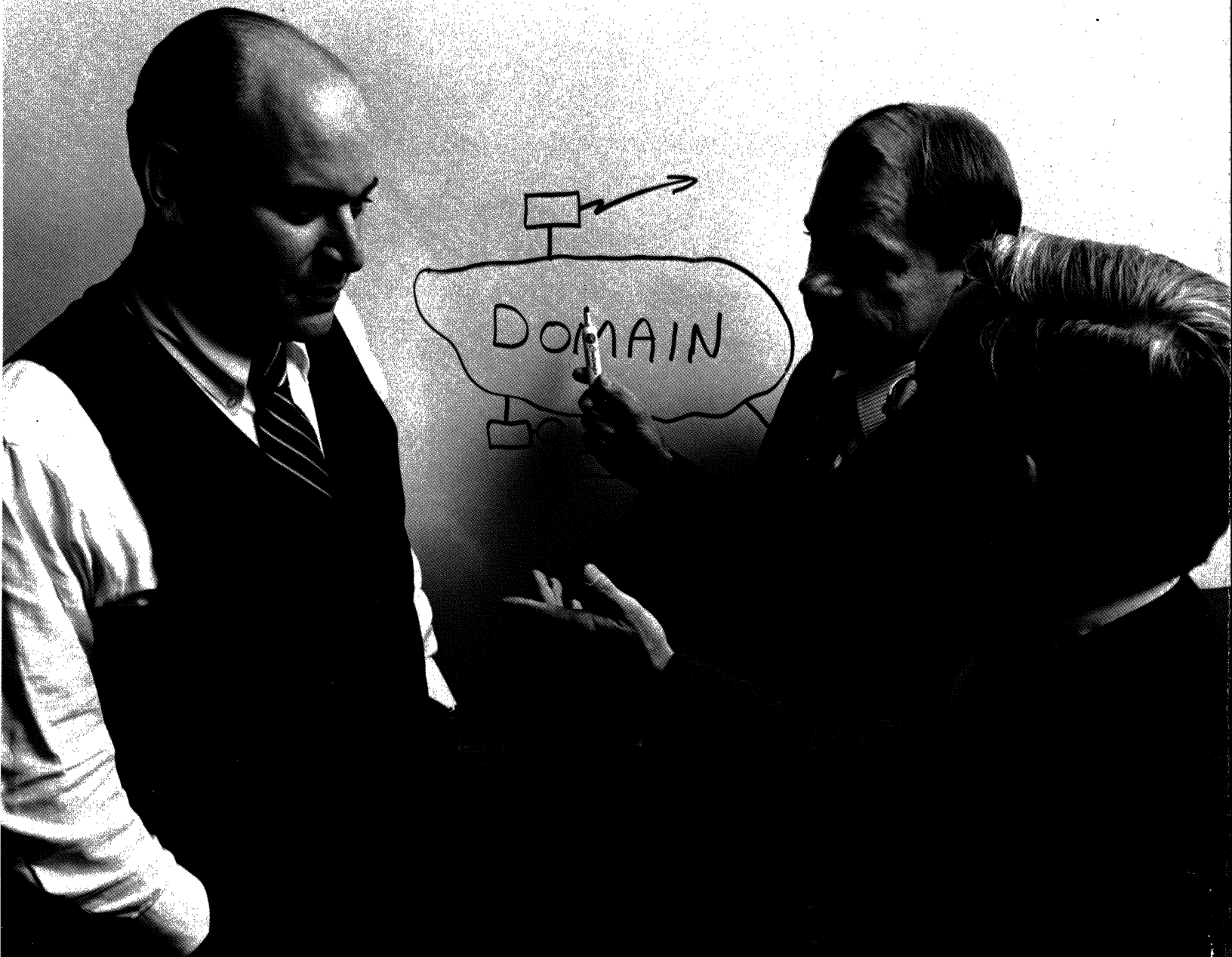


**Meeting the demand for a
more responsive, more productive
approach to computing.**



apollo computer

The first Distributed Operating

Function Keys
with Programmable Legends

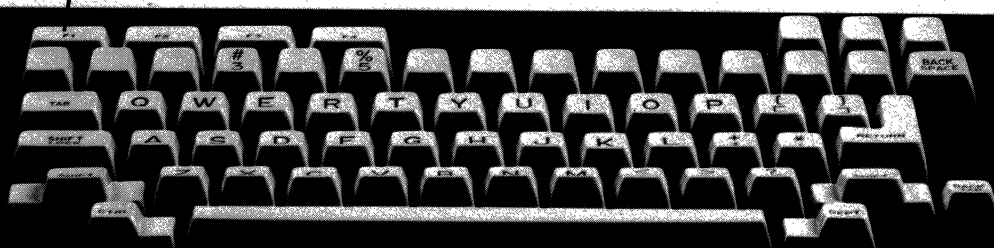
Multiple
Virtual Terminals

Variable Character
Fonts and Graphics

The Computational Node provides each user on the network with a dedicated computing capability, access to system resources, and optional local dedicated disk storage. The Computational Node has multiple 32-bit processors that give each user a performance level that rivals the best mid-range timesharing systems, but one that is dedicated to a single user.

The Computational Node also has a fully associated virtual memory mapping system which provides 24-bit virtual address and translates to a 22-bit physical address. In effect, each user process has access to a multi-megabyte program and data space supported by a large physical memory of up to 1 million bytes (the minimum is 512K bytes), which means that each user can solve very large problems on his own dedicated system.

The file storage of the Computational Node can be either a local fixed media Winchester disk providing a minimum of 33 million bytes, or a partition on a remote disk accessible over the entire network. Since the storage provided on all nodes on the network is viewed as a uni-



Multi-Access Interactive Network.

form, very large distributed file system, access to remote files is comparable to access to local files.

Each user has a powerful command capability with a multiplicity of access modes above the conventional language level.

DOMAIN permits user interactions via a variety of modes. In addition to simple command level interaction, DOMAIN provides user interfaces to menu selections, function keys, and graphic pointing devices. The DOMAIN command environment is a full-programming language, including such features as:

- simple program execution and control
- multiple program execution by stream connections
- execution control statements (if-then-else, case, etc.)
- procedures
- variables
- standard functions
- filters and software tools

This capability provides a level of programming above the conventional language level (e.g., FORTRAN) which encourages modularity, simplicity, and re-use of application programs.

DOMAIN's high level of interactiveness also extends to its integrated bit map display capability.

The fine resolution display of the system provides each user a direct port into the operation

of his programs. The display is 1024 pixels high by 800 pixels wide for a detailed representation of both character fonts and graphic images. And the image writing occurs at memory writing speeds – as fast as $1/60$ of a second – to construct a complete new image.

The display system is also an important new element in software design. It supports multi-

ple windows into different processes – as if you were working at your desk with multiple sheets of paper. These windows can be presented side-by-side or overlaid in whole or part. The display manager allows any window to be brought into full screen view instantly. And windowing allows the operating system to support multiple command environments simultaneously. For example, the



The heart of the system: a dedicated network of high performance computers designed to maximize the productivity of the individual user rather than maximize computer utilization.

The essence of Apollo's DOMAIN is a network of nodes. The network provides data sharing and a community environment to a group of users, and each user has a dedicated computer system connected as a node to the network.

Individual users get the benefit of significant large machine performance and functionality, along with substantial data storage and closely-coupled interaction between him and his computer. And the network supports his involvement in the community of users, sharing

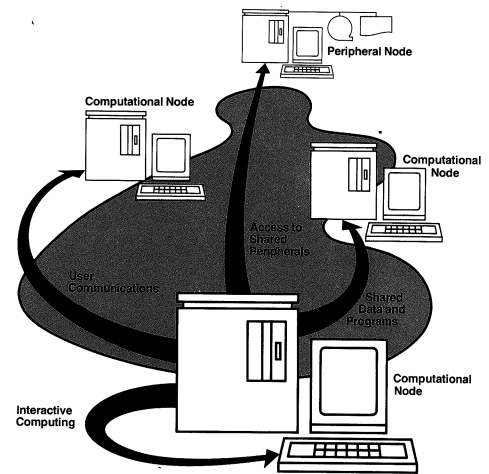
data and collaborating on problem solving.

The network itself is a high-speed, coaxially-connected communications system which connects all the nodes in such a way that each user can access his own data or his neighbor's with comparable speed and functionality. Since each user owns his own system, no one suffers performance degradation from another's activity. And since the failure of one node will not affect the performance of another, the network is essentially fail-safe.

Every user on the network has total access to the system's resources, data and facilities.

The nodes connected to the network are dedicated, powerful computer systems designed to support a single user. Physi-

cally, each node consists of a display monitor, a keyboard and an electronics enclosure.

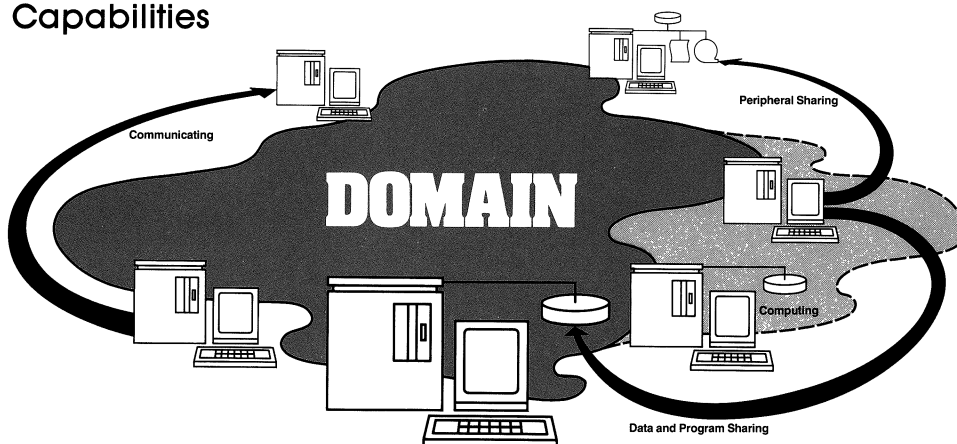


Functionally, each node gives the individual user:

- mainframe capabilities (FORTRAN 77)
- large virtual address space
- virtual memory management
- large physical high speed memory
- large disk storage capacity
- high quality display system
- high performance network interconnect, allowing:
 - access to distributed resources
 - modular design
 - incremental growth
 - high availability

While there are several basic nodes on the network with which to build complex applications, the Computational Node is the backbone of the system. Additional nodes include the Peripheral Node for shared peripherals such as line printers and magtapes.

Concurrent Capabilities



DOMAIN

The next major phase in the

The era of timesharing is ending, and a new form of interactive computing, based on a high-performance local network of dedicated computers in a distributed environment, is here. It is Apollo's DOMAIN (Distributed Operating Multi-Access Interactive Network) processing.

DOMAIN marks the third important phase in the history of computer architecture—an evolution from batch processing in the 60's, to timesharing in the 70's, to distributed networks in the 80's.

Access Versus Processing

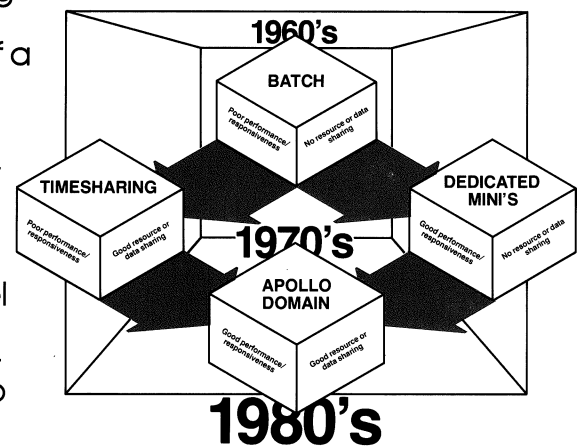
	Access	Processing
Batch	(centralized)	(centralized)
Timesharing	(distributed)	(centralized)
Domain Processing	(distributed)	(distributed)

In effect, DOMAIN processing retains the advantages of both timesharing and the dedicated minicomputer with none of the inherent disadvantages. Each DOMAIN user is provided with the best of today's timesharing systems, but with the performance and interactive levels of a dedicated system.

The principal advantages of DOMAIN are greater productivity and total system cost-effectiveness. The specific features which provide these benefits are: One, a high level of predictable performance, including a VLSI CPU (with 32-bit architecture) dedicated to each user on the network.

Two, a new mode of user machine interactivity, including a high-resolution bit map display permitting each user to run multiple programs simultaneously.

Three, network-level modularity, providing a system with a very high performance level, a wide range of growth capability, and a vast improvement in system reliability and availability.



Processing history of computer architecture.

While the tremendous advances in VLSI technology, operating systems software, magnetic storage devices, video display techniques and distributed communications have all contributed to the DOMAIN concept, it is the cost/performance improvements in every one of these areas that have made DOMAIN a practical reality.

Today's technology allows us to economically build complete networks of dedicated computer systems that can provide a level of performance and responsiveness to individual users that was unheard-of – and unaffordable – just a few years ago.

Apollo Computer: the company that put it all together.

The DOMAIN concept was

diversity of skills gives the company unusual depth, strength and direction. In every important corporate position is a



developed by a team of leading computer innovators who saw the need for a new and dramatically different approach to computing in the 80's. The kind of original thinking that went into the concept of DOMAIN has also gone into the formation of the company behind it.

Apollo Computer was founded by seven key individuals whose

proven leader with an impressive record of success.

Apollo Computer begins with a compelling new concept and the ability to make that concept a successful, working reality.

compilation of one program can proceed in parallel with the editing of another. Or, queries can be generated during the writing of a document; or, mail can be monitored and received while performing totally unrelated tasks, etc. All of this is conveniently managed by the user in a manner which is transparent to application programs.

Software "streams" provide a uniform and cooperative interface to other programs, peripherals and files.

Streams represent the I/O connection between programs, files and peripherals. They provide application programs with a uniform I/O interface so that, once written, they can be connected to other processes, local or remote files, or shared peripherals. When the streams are connected to other processes in a stream network, complex applications can be easily developed by interconnecting a large number of smaller, simpler programs. This encourages modularity in software, and aids in the debugging process. And since these programs become simple and general purpose, they can be used by many people and for many applications, thereby reducing significantly the overall software costs of an application.

The modular configuration of DOMAIN makes it reliable, versatile and easily expandable.

The physical packaging of the DOMAIN system comprises only three basic components: a display, a separate keyboard, and an electronics cabinet.

The display CRT is contained in a metal cabinet in a portrait orientation. The bit map display allows a variety of fonts to be displayed within a number of virtual terminals – all of which can be independently controlled by software.

The keyboard has a set of eight function keys which correlate to eight display areas on the lower part of the CRT screen. These areas display the current function names and can be rapidly changed as the application requires.

All central components for each node are packaged in a 29" high standard cabinet. The cabinet contains the optional 33 megabyte Winchester disk, all the electronics associated with the central processor, memory, network controller and the display system. It also contains an optional 1 megabyte diskette, and an optional MULTI-BUS® controller for standard peripherals, such as line printers and magtapes. The system is mechanically designed

so it will fit stand-alone as well as desk pedestal enclosures.

DOMAIN has wide applications.

DOMAIN was designed to accommodate a wide range of application environments, including scientific, engineering, research, finance, CAD/CAM, text processing and transaction processing. Because of the system's large address space, it is capable of running very large, single-program applications. Its inter-program or inter-process communication mechanisms make it equally effective for multiple program applications.

General Specifications of DOMAIN.

The dedicated computing module with:

- 16 megabyte virtual address VLSI CPU
- 1/2 to 1 megabyte memory
- bit map display (1024 x 800)
- 33 megabyte Winchester disk (optional)
- 1 megabyte diskette (optional)
- 10 megabit/sec network controller
- detached keyboard with function keys

Apollo DOMAIN: A new level of computer technology providing greater productivity, increased cost effectiveness, and enhanced functionality.

DOMAIN

apollo computer

Founders of Apollo Computer Inc.

John William Poduska
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Charles P. Spector
Executive Vice-President
Chief Operating Officer

Robert M. Antonuccio
Vice-President, Manufacturing

David L. Nelson
Vice-President, Systems
Development

J. Michael Gresta
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David G. Lubrano
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Chief Financial Officer

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